REMARKS

Claim 2 has been amended. Support for the amendment can be found in the Specification, beginning with page 6, line 21 through page 7, line 8, and support for the amount of sulfur is found on page 7, lines 9 to 20 and in the Examples.

Upon entry of the Amendment, claims 2, 16, and 19 are pending in the application.

Claims 2 and 19 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Hashimoto (US 4,714,734, of record) and further in view of Fukuhara (JP 2000-17115, of record). Hashimoto and Fukuhara are applied in the same manner as set forth in the Final Rejection dated October 28, 2003 (Paragraph 2).

Applicants submit that the tire reinforcing member in claim 2 recites:

> A pneumatic tire reinforced with a tire reinforcing member comprising:
> (a) at least one composite layer comprising a coating rubber composition and steel cords, and
> (b) at least one squeegee rubber composition layer comprising a rubber composition, which adjoins to the composite layer,
> wherein a Cobalt salt of an organic acid, as an adhesion promoter, and sulfur are compounded into the squeegee rubber composition layer, the amount of the Cobalt salt of an organic acid being 0.1 to 0.3 part by weight in terms of a Cobalt atom and the amount of sulfur being 3 to 8 parts by weight each based on 100 parts by weight of the rubber component of the squeegee rubber composition,
> wherein a basic inorganic filler is compounded into the squeegee rubber composition layer in an amount of 0.1 to 20 parts by weight based on 100 parts by weight of the rubber component of the squeegee rubber composition, wherein the basic inorganic filler is a hydrotalcite mineral represented by the following Formula (I) or a calcined product thereof:

$$[M_1^{2+})_{(1-x)}(M_2^{3+})_x(OH^-)_2]^{x+}\bullet[(A^{n-})_{x/n}\bullet mH_2O]^{x-} \qquad (I)$$

wherein M_1^{2+} is a divalent metal cation, M_2^{3+} is a trivalent metal cation, A^{n-} is an n- valent anion, x is the number satisfying an equation $0 < x \leq 0.5$, and m is zero or a positive number, and

wherein the reinforcing member constitutes at least one of a carcass ply and a belt ply, and wherein the pneumatic tire is at least one of a truck tire, a bus tire and an off-road tire.

The object of the present invention is to provide a tire reinforcing member and a tire to which the tire reinforcing member is applied, in which the tire reinforced with the tire reinforcing member is capable of enhancing resistance to adhesion loss and endurance of a tire, to a great extent, without affecting initial adhesion between the coating rubber and the steel cords.

The Examiner regards the side rubber, S, in Example 8 (column 20) of Hashimoto, as similar to Applicants' squeegee rubber. The compounding composition and the physical properties of the side rubber are shown in Example 7 in Table 5.

In general, a sidewall rubber undergoes repeated stress and is exposed to sunshine. Accordingly, the sidewall rubber requires flexibility, fatigue resistance, and resistance to aging or ozone. Example 7 in Hashimoto shows an improvement over resistances to heat and ozone, which are required for sidewall rubber. That is, the sidewall rubber has a hardness (57), tensile strength (Tb) (158 kg/cm^2), and elongation (Eb) (630%) as shown in Example 7. In addition, in Example 7, sulfur is compounded in the amount of 2.5 parts by weight. However, Example 7 does not have any cobalt salt of organic acid compounded into the side rubber. On the other hand, although Comparative Example 15 (column 21, Table 6) in Hashimoto describes physical

properties of a known rubber compound for sidewalls, the amount of compounded sulfur is 1.8 parts by weight. Additionally, as in Example 7, Comparative Example 15 does not contain any Cobalt salt of an organic acid. Further, Comparative Example 15 shows hardness (55), tensile strength (Tb) 9160 to 161 kg/cm^2), and elongation (Eb) (610 to 630%), which is similar to Example 7.

Unlike in Hashimoto, in the present invention, the cobalt salt of an organic acid is used to attain adhesion with the steel cords. However, in the case of side rubber, cobalt salt is not generally used because it results in a decrease in physical properties, such as deterioration of heat-resistance.

In addition, the amount of sulfur compounded in the present invention is 3 to 8 parts by weight per 100 parts by weight of the rubber component, which is used in forming Cu_xS in order that the Cu_xS exerts adhesion with the steel cords. The explanation for the amount of sulfur used in the present invention is disclosed on page 7, lines 9 to 20 of Applicants' specification. On the contrary, in the case of the side rubber, such an increased amount of sulfur will produce an excessive hardness in the side rubber causing deterioration in flexibility, thereby resulting in occurrence of side-crack.

In order for the coating rubber to provide better adhesion to the steel cords, the present invention has a low heat-generation, and endurance to a repeated shearing stress. For that purpose, the present invention has a high strength and high elasticity (hardness).

The squeegee rubber of the present invention, as set forth in the specification and as defined in claim 2, contains an amount of hydrotalcite mineral in the rubber composition in an amount similar or equal to the coating rubber composition for steel cords.

In the case of the squeegee rubber composition in the present invention, hardness is in the range of 61 to 62, tensile strength (Tb) is in a range of 193 to 209 kg/cm^2, and elongation of 379 to 411%, which shows higher hardness and unexpectedly higher tensile strength than those of the side rubber, S, in Hashimoto. Applicants provide experimental data in the § 1.132 Declaration which is attached herewith, which clarifies the unexpected superiority in hardness, tensile strength (Tb), and elongation (Eb) between the side rubber, S, disclosed in Hashimoto and the squeegee rubber composition of the present invention.

In the Examples of the present Specification, the squeegee rubber contains 5 parts by weight sulfur and 2 parts by weight of cobalt salts of naphthenic acid (0.2 in terms of a Cobalt atom). The squeegee rubber composition of the present invention is designed to be a rubber composition closely related to the coating rubber composition for steel cords as mentioned above (the same composition was used except for the hydrotalcite).

Therefore, the squeegee rubber of the present invention does not function like the side rubber of Hashimoto, and the squeegee rubber layer of the present invention is made adjoined to the composite layer comprising a coating rubber composition and steel cords, and the side rubber layer is disposed as an upper layer of the squeegee rubber layer.

The use of Hashimoto's side rubber, S, as the squeegee rubber layer, which adjoins to the composite layer comprising a coating rubber composition and steel cords in the present

invention, will cause sulfur and the cobalt-salt of an organic acid, which has an influence on the adhesive property, to migrate into the side rubber during vulcanization or running of a tire. Accordingly, the amount of sulfur and cobalt-salt of an organic acid will be reduced and the squeegee rubber layer will not produce the adhesive strength as in the presently claimed invention. For that reason, in the squeegee rubber of the present invention, the amount of sulfur and a cobalt-salt of an organic acid are compounded (in the Example, both of the two is compounded in an equal amount) to suppress the falling of adhesive strength due to the above migration.

Further, in such a case as off-road tires, truck tires, and bus tires, which is subjected to repeated shearing strength under the condition of a high load or speed, the side rubber, S, is designed to be a rubber for an exclusive use in the tire side. For that reason, the side rubber, S, has a soft nature (for example, lower hardness and greater elongation), which leads to greater moving of the rubber at the inner part of tire, to promote heat generation, and possibly causing tire damage including separation.

As mentioned above, it is not possible to apply the side rubber, disclosed in Hashimoto, to the squeegee rubber of the present invention. Consequently, the presently claimed invention would not be made obvious over the teaching of Hashimoto. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection.

Claim 16 is rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Hashimoto and Fukuhara as applied in claim 2 above, respectively, and further in view of

Kobayashi (US 5,965,640, of record), Nosu (US 5,464,896, of record), and the Admitted Prior Art (Page 5, Lines 13-15).

Claim 16 is dependent upon claim 2. Applicants submit that claim 2 is not obvious over Hashimoto in view of the other art, since the other art does not make up for the deficiency of Hashimoto. Therefore, claim 16 is patentable based on its dependency on claim 2. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejections of claim 16.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto and Fukuhara as applied in claim 2 above and further in view of Masson (WO 99/24502, newly cited).

Claim 20 has been canceled. Therefore, the rejection over claim 20 is moot.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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